

**BEDROCK TOPOGRAPHY OF NEW YORK STATE
NIAGARA SHEET**

prepared by
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Introduction

Beginning in 2019, under the guidance and funding provided by the United States Geological Survey - Great Lakes Geological Mapping Coalition Award Number G20AC00401, the New York State Museum - Geological Survey (NYSGS) began a statewide effort to conduct topographic mapping of bedrock elevations throughout New York. The Niagara Sheet, which includes mostly western New York, extends across the Erie-Ontario Lowlands and Allegheny Plateau physiographic provinces. The region consists of the adjacent counties: Allegany, Cattaraugus, Chautauqua, Erie, Genesee, Livingston, Monroe, Niagara, Orleans, and Wyoming (see inset map). The region contains large bodies of water, Lake Ontario and Lake Erie, as well as many smaller water bodies such as Chautauqua Lake, the Allegheny Reservoir, and Silver Lake. Surficial and subsurface bedrock point data and maps were compiled from publicly available sources, vetted, and organized into a comprehensive geospatial database. A technical workflow was developed to characterize the overall geology and differentiate between the underlying bedrock and overlying unconsolidated sediments. The resulting bedrock elevation map provides a detailed topography of the bedrock surface across the Niagara Sheet. This map is useful for various applications including geological studies, engineering and construction, natural resource management (such as water or mineral resources), energy and environmental studies.

Methodology

A total of 24,356 bedrock control points was used to delineate bedrock topography in the Niagara Sheet. These points consisted of 14,679 water wells, 7,537 bedrock outcrops, 2,109 engineering boreholes, and 31 oil and gas wells. These data were compiled from a variety of public sources and imported into ESRI's ArcGIS Pro 3.3.1 software platform. Ground surface elevations for all control points were extracted from a compilation of three separate digital elevation models (DEMs) which were resampled to match a 1-meter LIDAR DEM cell size. Bedrock elevations were calculated at each location by subtracting the depth to bedrock from the ground surface elevation. Fifty-foot bedrock elevation contours were auto-generated and manually refined through a multi-step quality control process to resolve any interpolation errors. The finalized contours were converted into a 1-meter raster, using the "Topo to Raster" tool, that represents county-wide bedrock topography.

Summary

The New York State Museum – Geological Survey has developed a detailed Bedrock Topography Map for the Niagara Sheet. This map compiles numerous published and unpublished surficial and bedrock data sources assessed by geologists at the NYSGS through multiple quality control procedures. The resulting bedrock elevations reveal a range of distinct geological features including a variety of Paleozoic bedrock erosional profiles and evidence of past glaciation. These characteristics are likely the result of a diverse set of influences including bedrock stratigraphy, structural deformation, and erosional processes such as past glaciation and fluvial geomorphology. This map is significant for applications in geological research, engineering, natural resource management,

environmental studies, energy management and energy development applications such as geothermal heat sources. Continued research and work on subsurface geology will provide additional data and insight and will enhance the scientific understanding of bedrock geology throughout New York State.

Explanation

- Data Point
- ~ 50ft Bedrock Elevation Contour
- State Route
- U.S. Route
- Interstate
- State Boundary
- International Boundary
- NYS County Boundary
- Adjacent State/Province
- Water Body

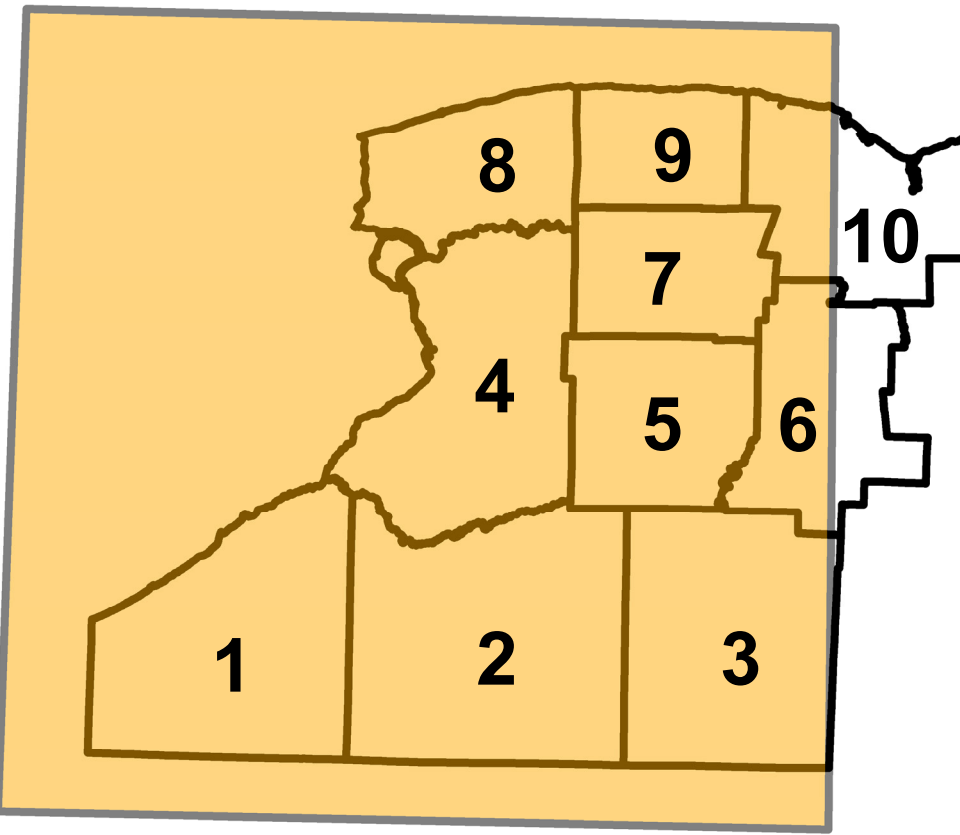
Bedrock Topographic Elevation

Feet-amsl

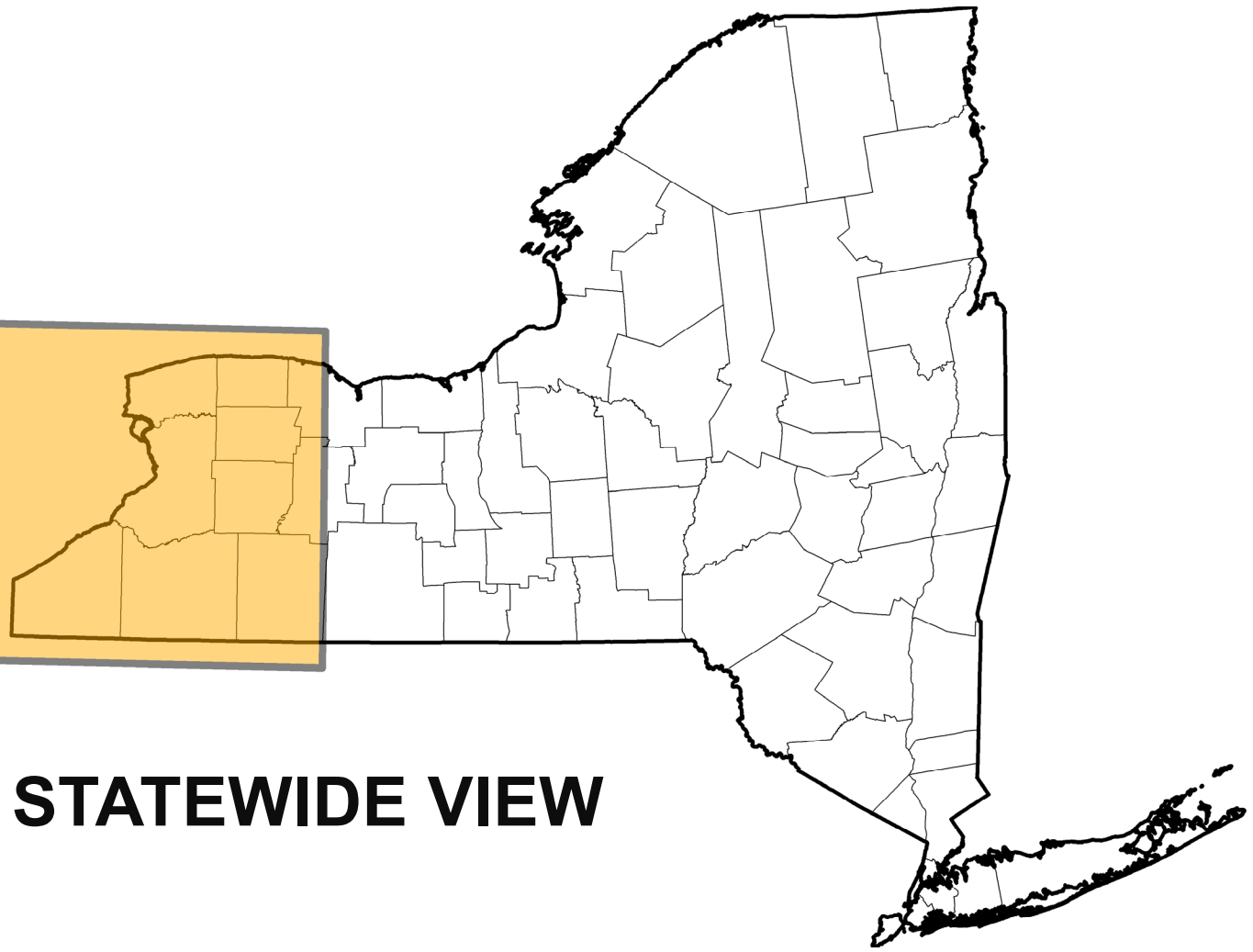
- 200 - 0
- 0 - 200
- 200 - 400
- 400 - 600
- 600 - 800
- 800 - 1,000
- 1,000 - 1,200
- 1,200 - 1,400
- 1,400 - 1,600
- 1,600 - 1,800
- 1,800 - 2,000
- 2,000 - 2,200
- 2,200 - 2,400
- 2,400 - 2,600

REGION LOCATION

COUNTY LOCATION



ADJACENT COUNTIES:
1) Chautauqua
2) Cattaraugus
3) Allegany
4) Erie
5) Wyoming
6) Livingston
7) Genesee
8) Niagara
9) Orleans
10) Monroe



STATEWIDE VIEW

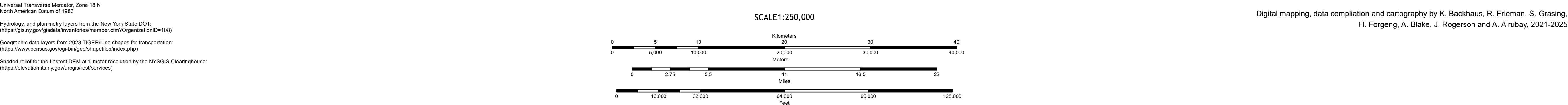
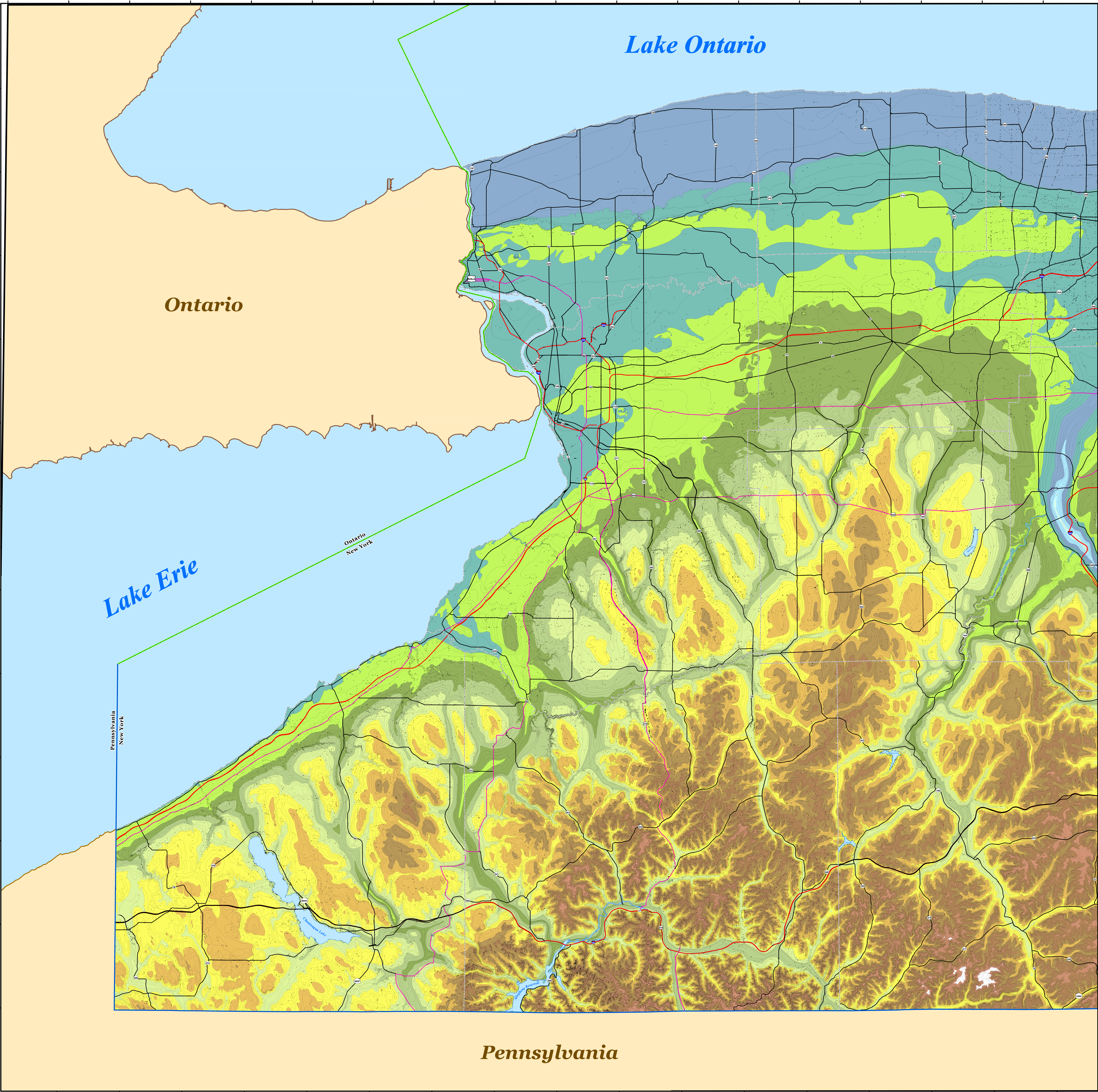
NOTICE

This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program - GLGMC award number G20AC00401 in the year 2019.
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Disclaimer: Geologic Map Raster
Elevation values on this map may display minor inaccuracies resulting from the rasterization process. For correct elevation details, refer to the contour data.

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